

Travelling Stock Reserves

Monitoring and audit strategy



Local Land
Services

This project has been funded by NSW Environmental Trust



Travelling Stock Reserves Monitoring and Audit Strategy

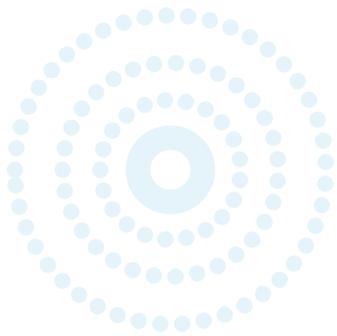
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Introduction

The NSW Travelling Stock Reserves State-wide Plan of Management (the Plan of Management) informs this Travelling Stock Reserve (TSR) monitoring and audit strategy. The monitoring described in this strategy uses a risk management approach to selecting sites and frequency of monitoring. It is general in nature and intended for use by each Local Land Services regions to guide the development of a TSR monitoring plan.

The risk management framework considers site selection based on conservation status, irreplaceability (for example threatened and endangered ecological communities and species), key threats (such as presence of invasive species), agreement special conditions, permit length and permit holder's management history.

The Plan of Management outlines the importance of the outcomes of TSR management being monitored to determine the success or otherwise of management strategies in place.

Monitoring allows for comparison of change over time at a given location and enables the land manager to review existing management periodically and adjust management regimes, where required to meet the site objectives.



Conservation audit and monitoring strategy

The Plan of Management endorses a process of monitoring, evaluation, reporting and improvement as being vital to determine whether management outcomes have been achieved. For this to be possible, desired outcomes must first be clearly stated.

Regional TSR Annual Business Plans will identify objectives for TSR management and performance indicators to measure plans against.

The types of performance measures will be defined in the regional TSR Annual Business Plans and will help to inform the monitoring strategy.

Periodic third-party audits may be considered to enable objective analysis of land management outcomes at both a site (TSR) and a regional level for compliance with the aims of agreed Annual Business Plans. The frequency of audits should be based on a risk management framework which may consider things such as irreplaceability or key threats to vegetation communities or species.

Monitoring of TSR may target particular land management aspects. This strategy outlines a standard audit for biodiversity enhancement. This involves at a minimum, undertaking a conservation assessment using the rapid conservation assessment method (RAM) developed by Local Land Services, including a photo monitoring point (PMP) and reviewing observed changes in vegetation condition against management plan objectives.

Priority setting for TSR monitoring

It is unrealistic to have a PMP on every TSR due to resourcing limitations; therefore it is necessary to prioritise sites using a risk management approach as outlined in the Plan of Management.

Selecting sites for monitoring could be based on conservation status of high, medium or low.

Alternatively priorities can be based on threats such as invasive species or the current management, for example travelling stock or grazing permits.

The conservation value rating of a TSR into high, medium and low is described fully in the Rapid Conservation Assessment Method Training Package and Guidelines and is illustrated below in Table 1.

It consists of three main components, the conservation status (Part A), landscape context (Part B) and vegetation condition (Part C), to provide an overall conservation value of high, medium or low.

Table 1: Conservation value assessment matrix

Conservation Status	Landscape Context	Condition and habitat		
		High quality	Moderate quality	Low quality
Threatened	Large and / or connected	High conservation value (HCV)	HCV	Medium conservation value (MCV)
	Moderate	HCV	MCV	MCV
	Small and disconnected	HCV	MCV	MCV
Depleted	Large and / or connected	HCV	MCV	Low conservation value (LCV)
	Moderate	HCV	MCV	LCV
	Small and disconnected	HCV	MCV	LCV
Common	Large and / or connected	HCV	MCV	LCV
	Moderate	MCV	LCV	LCV
	Small and disconnected	MCV	LCV	LCV

Monitoring TSR for conservation should prioritise high conservation value TSR as these TSR will have a threatened or depleted conservation status and may for example have a threatened ecological community present.

The type of management occurring and other activities on the TSR such as revegetation, invasive weed or pest animal management should also be considered when prioritising TSR.

What to monitor on a TSR

As specified in the methods section, monitoring is mostly focussed on plants; however, since it's impossible to monitor everything, the first step in vegetation condition monitoring is to define what the priority is.

This involves the identification of a vegetation indicator(s) appropriate to that TSR by the land manager and will act as a surrogate to determine site management objectives and can be informed by the RAM vegetation condition assessment.

Indicators enable a relatively simple vegetation determinant to be used to assess the success of recent management.

In most cases the monitoring will involve assessing the effects of grazing on the vegetation quality of a TSR as this is the main use on many TSRs. For example, in grazing situations often the presence of tree or shrub regeneration is used to confirm grazing has been effectively managed.

Photo points are established to depict the status of a particular indicator on a TSR. Regular monitoring of PMPs allows the land manager to make informed land management decisions

Indicators that can be used to demonstrate maintenance or improvement in habitat condition on TSRs, include:

- maintenance and recruitment of key palatable woody plants over time
- maintenance of habitat structure
- regulating grazing during critical periods, thus enabling increased native plant survival and recruitment in the short term
- measuring the success of revegetation actions including seedling germination and survival
- determining the success of environmental weed control for example, woody weed or vine control
- determining the success of site rehabilitation such as plant growth after rabbit or erosion control works
- determining the status of rare plants.



Figure 1: Coreen TSR PMP in 2006.



Figure 2: Coreen TSR PMP in 2016 indicating a desirable increase in bullock regeneration.



Figure 3: PMP monitoring on large grassland TSR.

Methods used to monitor

Monitoring can be done formally as outlined below and informally via observation. Regular short inspections of TSRs often helps avoid more significant environmental issues occurring. For example, the early detection of regeneration events of preferred trees, shrubs and grasses may enable the management of grazing to enhance the quality of the habitat found on particular reserves.

Early detection of invasive weeds can enable much better control, as plants may not have seeded or the populations are still relatively small.

In most cases when monitoring for biodiversity maintenance and enhancement, the monitoring of plants at a TSR will be used to determine any change.

Plants are used because they are a critical barometer of ecological changes and are often a target of our management activities.

For example:

- tree or shrub regeneration
- ground cover such as perennial palatable grasses and forbs
- revegetation such as direct seeding or where tree planting has occurred
- extent and percentage cover of active weed control
- plant growth associated with rabbit harbour destruction
- plant growth associated with areas of erosion.

As described in the *RAM Training Package and Guidelines*, the preferred method of formal monitoring is based on establishing a PMP, coupled with undertaking RAM vegetation condition assessments.

PMPs are permanently located to enable photographing the same view over time. PMP photos provide a permanent visual record of a site(s) and are an important tool to evaluate management objectives.

In some instances, set transect monitoring of vegetation structure and flora elements may be used where more detail is required about particular environmental elements, for example ground flora changes. In these instances, the Federal Governments Monitoring Evaluation Reporting Improvement Tool (MERIT) method may be used to establish and record more detailed information.

www.nrm.gov.au/my-project/monitoring-evaluation-reporting-and-improvement-tool-merit/user-guides

Photo Monitoring Point (PMP)

Ideally PMPs are easily located and regularly monitored (for example annually) and monitoring occurs over many years on the TSR. This provides a simple and efficient way to illustrate a distinct feature that is to be monitored.

Where to locate PMPs?

PMPs should be located to provide:

- Easily recognisable locations with minimal access issues (Proximity to a road or track will aid efficiency for future monitoring).
- Photo views to illustrate a distinct feature that you want to monitor, for example a boundary between grazed and un-grazed vegetation, an area subject to weed control, or the growth of revegetation or plants regenerating.
- A permanent distinguishable feature in the photo view to assist in photo comparison.

Try and avoid east-west PMPs because at certain times of year the rising or setting sun can obscure your photo views.

How to establish PMPs

Steps to establish PMPs:

1. Determine desired view to illustrate the distinct feature selected, location and direction.
2. Record location (this will be done automatically if using the RAM Collector application) and view direction (Often automatic depending on the photo software).

Establish permanent physical point for easy identification in future (for example steel dropper(s), stump, old tree, or sign.)

Alternatives to photo monitoring points

While the establishment of a PMP can be the simplest way to document the growth of vegetation, weed control or grazing management in particular landscapes such as grassy woodlands, in densely treed areas alternatives to monitoring may be required.

This could include observational monitoring techniques for example; structural features may be noted along with the condition of target species in particular communities.

Determining the objective of the monitoring program will help to guide the most appropriate method if a PMP is not suitable.

Figure 4: Steel droppers used as PMP.



Figure 5: edge of TSR sign in bottom left of photo used for PMP.



Monitoring TSRs with grazing present

The establishment of new grazing permits or the renewal of a current permit provides an opportunity to assess the condition of a TSR using the RAM to ensure as a minimum the maintenance and possibly the enhancement of conservation status during the permit period.

Table 2 below illustrates the recommended monitoring method to be undertaken on TSRs where grazing occurs, based on grazing method and vegetation condition state. It is based on the vegetation condition as determined by the RAM and the modified vegetation assessment state and transition (VAST) rating.

The modified VAST model is used because it summarises the degree of change that has occurred to native vegetation relative to its estimated undisturbed condition. It is a useful model for land managers because it also incorporates an estimate of the regenerative capacity of modified native vegetation.

More information on VAST is available in Appendix 1.

Table 2 Preferred monitoring method with grazing managed for conservation purposes.

TSR Monitoring to maintain or enhance vegetation condition							
Vegetation condition	Modified VAST condition state	Grazing method				Monitoring method	
		None	Travelling stock only	Short-term permit <90 days	Long-term permit >90 days	Annual PMP	Seasonal assessment pre-and during grazing
	Residual	✓				✓	
High	Modified A	✓	✓			✓	✓
	Modified B		✓	✓		✓	✓
Moderate	Transformed A		✓	✓		✓	✓
	Transformed B		✓	✓	✓	#	✓
Low	Replaced		✓	✓	✓		

PMP monitoring undertaken if TSR subject to Long-term permit.



High conservation value TSRs

Including Residual, Modified A and B vegetation condition states should have PMPs established and be monitored annually.

Seasonal informal assessment by the land manager prior to and during the grazing period to inform grazing suitability of the sward should occur on all Modified A and B condition state TSRs.

Moderate quality TSRs

Including Transformed A and B condition states. PMP should be established and monitored annually on all Transformed A TSRs and those Transformed B sites under long-term grazing permits.

Seasonal informal assessment by the land manager prior to and during the grazing period to inform grazing suitability of the sward should occur on all Transformed A and B condition state TSRs.

Low quality TSRs

Covers replaced condition state and generally do not require monitoring under this strategy. These TSRs are not recommended for conservation management unless they provide other values in the landscape.

Note there are many TSRs currently managed under Long-term grazing permits with a condition state higher than recommended in Table 1.

Ideally, in these cases, undertake a rapid conservation assessment to confirm condition state, if condition state is high or moderate:

- establish adequate PMPs to measure any impacts of grazing strategy
- review Long-term permit once the current term lapses
- consider issuing short term permits if existing permit holder's grazing practice is impacting on vegetation condition.

Monitoring where specific external investment occurs

On TSRs subject to a management plan with external investment that specifies active land management, the standard annual PMP monitoring outlined may not be adequate.

For example, invasive weed or pest animal control, threatened species management or revegetation may require additional monitoring methods to be used.



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Appendix 1: Vegetation assessment state and transit

The modified VAST model has been developed, to assist with vegetation condition assessments.

The method was initiated and trialled in a large-scale habitat restoration project in the Riverina. Enriching biodiversity in the NSW Riverina bioregion by managing the TSR network for nature conservation - a large scale habitat restoration project (2017).

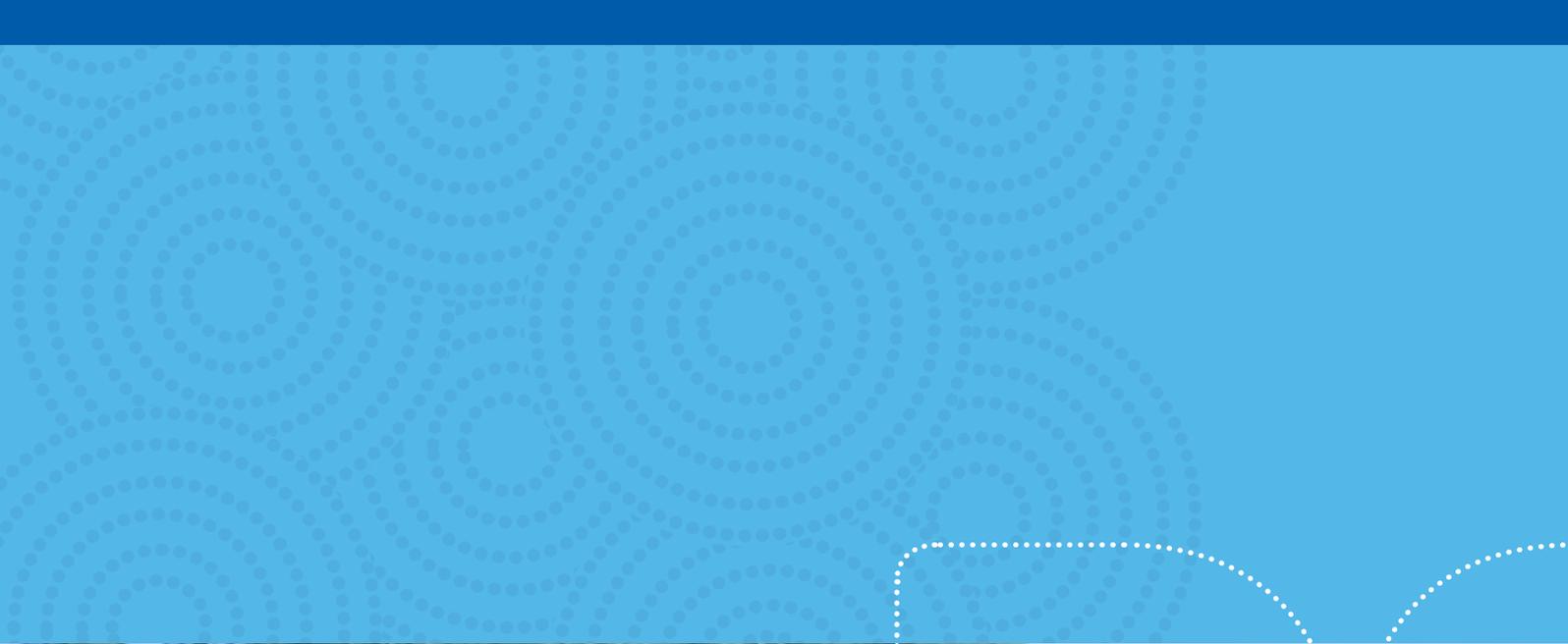
It was based on the VAST model (Thackway and Lesslie, 2006) and provides six ratings based on regenerative potential, vegetation layers present, ground layer diversity and overall vegetation attributes.

The modified VAST ratings have a direct link with the vegetation condition scores in the rapid conservation assessment method. See Table 4 of the *RAM training package and guidelines* for more detail.

The modified VAST is a best fit model and therefore consideration of the overall characteristics of a TSR when rating the reserve in the field is essential.

Vegetation condition rating: High quality				
RESIDUAL Native vegetation community near natural	Excellent potential for natural regeneration	All vegetation layers (stratum) present	Ground layer has high species diversity	Very rare, only small fragments remain
MODIFIED A Native vegetation community intact	Good potential for natural regeneration	Most vegetation layers present	Ground layer has mostly high species diversity	Best examples of local native vegetation Few weeds are present
MODIFIED B Native vegetation community mostly intact	Reasonable potential for natural regeneration	Overstorey vegetation present	Ground layer has low species diversity	Good examples of local native vegetation Weeds <50 % and mostly annual pasture grasses and herbaceous weeds
Vegetation condition rating: Moderate quality				
TRANSFORMED A Native vegetation community significantly altered	Some potential for natural regeneration	Overstorey vegetation mostly present	Ground layer has low species diversity	Moderate examples of local native vegetation Weeds >50 % of groundlayer
TRANSFORMED B Native vegetation community significantly altered	Little potential for natural regeneration	Dominant overstorey patchy	Ground layer has few native species Most groundlayer species are absent	Poor examples of local native vegetation Groundlayer dominated by weeds
Vegetation condition rating: Low quality				
REPLACED Native vegetation replaced	No potential for natural regeneration	Natural vegetation layers absent	Native species absent-sparse	Native species absent or sparse Groundlayer dominated by weeds





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